1424 SHDSL Router Installation Guide

Version: 1.8 - 554584

23 January 2012

Http://www.oneaccess-net.com

Document properties

Subject	1424 SHDSL Router
Manual type	Installation Guide
Version	1.8
Code	554584
Modification date	23 January 2012 ©OneAccess

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Safety requirements

Carefully read the safety instructions, installation precautions and connection precautions as stated in chapter 2 - Installing and connecting the 1424 SHDSL Router on page 10.

Statements

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Hereby, OneAccess declares that this 1424 SHDSL Router complies with the essential requirements and other relevant provisions of Directive 1999/5/EC.

Hierbij verklaart OneAccess dat deze 1424 SHDSL Router overeenstemt met de essentiële vereisten en andere relevante bepalingen van Richtlijn 1999/5/EC.

Par la présente, OneAccess déclare que ce 1424 SHDSL Router est en conformité avec les exigences essentielles et autres articles applicables de la Directive 1999/5/EC.

Hiermit, OneAccess erklärt daß dieser 1424 SHDSL Router in Fügsamkeit ist mit den wesentlichen Anforderungen und anderen relevanten Bereitstellungen von Direktive 1999/5/EC.

Mediante la presente, OneAccess declara que el 1424 SHDSL Router cumple con los requisitos esenciales y las demás prescripciones relevantes de la Directiva 1999/5/CE.

A OneAccess declara que o 1424 SHDSL Router cumpre os principais requisitos e outras disposições da Directiva 1999/5/EC.

Col presente, OneAccess dichiara che questo 1424 SHDSL Router è in acquiescenza coi requisiti essenziali e stipulazioni attinenti ed altre di Direttivo 1999/5/EC.

Με το παρόν η OneAccess δηλώνει ότι το 1424 SHDSL Router είναι συμμορφούμενο με τις βασικές απαιτήσεις και με τις υπόλοιπες σχετικές διατάξεις της οδηγίας 1999/5/EC.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This Class A digital apparatus complies with Canadian ICES-003.

Environmental information

The crossed-out wheeled bin means that within the European Union the product must be taken to separate collection at the product end-of-life. This applies to the device but also to any accessories marked with this symbol.
Do not dispose of these products as unsorted municipal waste.
If you need more information on the collection points where you can present your end-of-life equipment for recycling, please contact your local importer.
For Belgium, you can contact rma@oneaccess-net.com.

De doorstreepte container wil zeggen dat binnen de Europese gemeenschap het product voor gescheiden afvalverzameling moet worden aangeboden aan het einde van de levensduur van het product. Dit geldt voor het toestel, maar ook voor alle toebehoren die van dit symbool voorzien zijn. Bied deze producten niet aan bij het gewone huisvuil.
Indien u meer informatie wenst over het inzamelpunt waar u afgedankte apparatuur kan aanbieden voor recyclage, gelieve dan uw lokale importateur te contacteren.
Voor Belgie kan u contact opnemen met rma@oneaccess-net.com.

Le symbole de la poubelle sur roues barrée d'une croix signifie que ce produit doit faire l'objet d'une collecte sélective en fin de vie au sein de l'Union Européenne. Cette mesure s'applique non seulement à votre appareil mais également à tout autre accessoire marqué de ce symbole. Ne jetez pas ces produits dans les ordures ménagères non sujettes au tri sélectif.
Si vous souhaitez plus d'information concernant le point de collecte où vous pouvez apporter vos appareils usagés afin qu'ils soient recyclés, veuillez contacter votre importateur local.
Pour la Belgique, vous pouvez prendre contact avec rma@oneaccess-net.com.

Das Symbol der durchgestrichenen Abfalltonne auf Rädern bedeutet dass das Produkt in der Europäischen Union einer getrennten Mülsammlung zugeführt werden muss. Dies gilt sowohl für das Produkt selbst, als auch für alle mit diesem Symbol gekennzeichneten Zubehörteile. Diese Produkte dürfen nicht über den unsortierten Hausmüll entsorgt werden.
Falls Sie weitere Auskünfte brauchen im Betracht der Sammelplätze für ausrangierte Apparate, wenden Sie sich bitte an Ihren örtlichen Importeur.
Für Belgien, bitte kontaktieren sie rma@oneaccess-net.com.

Documentation set

For all devices, the documentation set currently consists of the following:

Document	Description
1424 SHDSL Router installation guide	This is this document, it shows you how to install and connect the 1424 SHDSL Router.
TDRE manual	The user part of the TDRE manual explains how to configure a device and provides information about all features that can be configured in TDRE, i.e. encapsulations, routing, bridging, QoS, tunnels, IPSEC, ... The reference part of the TDRE manual contains a complete description of all the configuration, status, performance and alarm parameters for look-up purposes. The proxy management (also called Orchid function) parameters are described in the Orchid function manual.
Maintenance tools user manual	The 1424 SHDSL Router can be maintained and managed by a variety of maintenance and management tools. The Maintenance tools user manual describes these tools. Refer to the installation guides of the OneAccess devices, for an introduction on these tools.
TMA Quick Start Guide	This guide briefly highlights the Total Maintenance Application or TMA

All these documents, together with the free maintenance tool TMA and the firmware of the TDRE devices, can be found on the OneAccess Products distribution CD that is delivered with all TDRE products.

Organisation of this installation guide

This manual contains the following main parts:

Part	This part …
Installation guide	shows you how to install and connect the 1424 SHDSL Router. It also explains how to connect to the 1424 SHDSL Router on the pc.
Annex	gives some additional information.

Refer to the Table of contents on page 1 for a detailed overview of this manual.

Typographical conventions

The following typographical conventions are used in this manual:

The format …	indicates …
Normal	normal text.
Italic	• new or emphasised words • application windows, buttons and fields. E.g. In the *Filename* field enter …
Blue	references to other parts in the manual. E.g. “Refer to xx - Title for more information”.
Blue underline	• a hyperlink to a web site. E.g. www.oneaccess-net.com • a reference to another manual. E.g. “Refer to the TMA manual (PDF) for more information”. The abbreviation between brackets is an indication of the file format (PDF = Portable Document Format / CHM = Compiled HTML Help).

Graphical conventions

The following icons are used in this manual:

Icon	Name	This icon indicates …
	Remark	remarks or useful tips.
	Caution	text to be read carefully in order to avoid damage to the device.

TDRE

The Total Dynamic Routing Engine (TDRE) is a feature-rich operating system that guarantees a common feature set across the different OneAccess product lines and a uniform support by maintenance and management tools.

Audience

This manual is intended for computer-literate people, who have a working knowledge of computing and networking principles.

Your feedback

Your satisfaction about this purchase is an extremely important priority to all of us at OneAccess. Accordingly, all electronic, functional and cosmetic aspects of this new unit have been carefully and thoroughly tested and inspected. If any fault is found with this unit or should you have any other quality-related comment concerning this delivery, please submit the Quality Comment Form on our web page at www.oneaccess-net.com → Support → Quality Comment Form.

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Installation guide

1 Introducing the 1424 SHDSL Router

This chapter gives an introduction to the 1424 SHDSL Router. The following gives an overview of this chapter:

- 1.1 - General description on page 3
- 1.2 - 1424 SHDSL Router family overview on page 4
- 1.3 - Maintenance and management tools on page 5
- 1.4 - Maintenance and management tools connection possibilities on page 9

1.1 General description

The 1424 SHDSL Router is a secure SHDSL router for high bandwidth applications. The SHDSL multi-pair interface offers a bandwidth up to 22Mbps over up to 4 copper pairs.

High speed DSL access

The 1424 SHDSL Router includes a high speed symmetrical bandwidth in various DSL networks and at various local loop distances. It includes a SHDSL.bis interface with up to 4 copper pairs. This provides line rates up to 22Mbps on short distances and up to 10Mbps on operator standard loop lengths. The various pair bonding techniques make it suitable for any type of DSL infrastructure. The 1424 SHDSL Router supports both ATM and EFM modes in single and multipair topologies.

High network availability

A dedicated Ethernet interface is available as a backup when the DSL network is not available. Traffic is automatically routed to the available network. Alternatively this interface can be used for a DMZ zone (De-Militarised Zone).

Ethernet services

The 1424 SHDSL Router relies on the robust TDRE software, the OneAccess Bridging and Routing Engine offering advanced layer 2 and layer 3 functions. Ethernet functionalities include Spanning Tree Protocol, multiple bridge groups and VLAN features such as tagging, switching, QinQ, COS/TOS and TOS/COS mapping and Ethernet QoS. VLANs and ATM PVCs have the status and statistics characteristics of a physical interface.

Full service router

On IP level, the equipment implements different routing protocols such as RIP, OSPF and BGP-4 and Policy based routing. The 1424 SHDSL Router provides secured Internet access through a stateful inspection firewall. The business applications can be used based on central databases through IP VPNs. For this purpose, advanced VPN functions such as L2TP, GRE and IPSec with encryption are standard included. It provides best-in-class IP Quality of Service features including real-time processing of high priority, delay sensitive applications and guaranteed bandwidth for selected flows.

Accelerated deployment and service provisioning

As all TDRE routers, the 1424 SHDSL Router is manageable through a variety of maintenance and management tools. These include:

- A free graphical user interface for local or remote maintenance.
- A customisable Web-configuration utility.
- A CLI to facilitate scripting.
- Easy integration into TMA Element Management.

Technicians or the customer install the units with a standard configuration. Once connected to the network the 1424 SHDSL Router automatically retrieves all customer specific information from the service provider’s databases and thus becomes ready for the service.

USB interface

On some versions of the 1424 SHDSL Router, a USB interface is present. The USB interface is USB 2.0 compliant. It can be used to connect a mobile USB device for backup of the DSL connection over the mobile 3G network.

1.2 1424 SHDSL Router family overview

The following gives an overview of the 1424 SHDSL Router versions:

Standard version	SHDSL line pairs	Ethernet ports	USB interface	RAM	Flash
1424 SHDSLbis 1P	1	1+4	-	64MB	32MB
1424 SHDSLbis 2P	2	1+4	-	64MB	32MB
1424 SHDSLbis 4P	4	1+4	-	64MB	32MB
1424 SHDSLbis 1P U	1	1+4	1	64MB	32MB
1424 SHDSLbis 2P U	2	1+4	1	64MB	32MB
1424 SHDSLbis 4P U	4	1+4	1	64MB	32MB

1.3 Maintenance and management tools

This section gives a quick overview of the various maintenance and management tools that can be used to manage the 1424 SHDSL Router.

The following gives an overview of this section:

- 1.3.1 - Overview of various tools on page 6
- 1.3.2 - Upgrading the software on page 8

1.3.1 Overview of various tools

The 1424 SHDSL Router is manageable in many different ways. This section gives a quick overview of the various maintenance and management tools. These are:

Maintenance or management tool	Description and reference
TMA	TMA (Total Maintenance/Management Application) is a free Windows software package with a comprehensive graphical user interface that enables you to control the OneAccess products completely. I.e. to access their configuration attributes and look at status, performance and alarm information. For more information, refer to: • the TMA Quick Start Guide (PDF), this will set the user on the right track as quickly as possible, when starting with and using TMA. • the TMA user manual (PDF), for a detailed and extensive explanation about TMA and its use.
TMA Element Management	TMA Element Management is a management application designed to monitor large numbers of OneAccess devices. It combines the easy to use graphical interface of the stand-alone version of TMA with an event-logging application called the Element Viewer. Refer to the TMA Element Management manual (PDF/CHM) for more information.
TMA CLI	TMA CLI (TMA Command Line Interface) enables you to use its commands in scripts in order to automate management actions. This is particularly useful in large networks. TMA CLI is a complementary product to TMA and TMA Element Management. Refer to the TMA CLI manual (PDF) for more information.
ATWIN	ATWIN is a menu-driven user interface. You can read and change all attributes as with TMA, but in a more basic, textual representation using a VT100 terminal. Refer to the Maintenance tools manual (PDF) for more information.
CLI	CLI is also a Command Line Interface, although not so extensive as TMA CLI. Experienced users who are familiar with the syntax can access the TDRE devices more quickly than with TMA or ATWIN. Refer to the Maintenance tools manual (PDF) for more information.
Web Interface	The Web Interface is an ATWIN alike menu-driven user interface. You can read and change all attributes as with TMA, but in a more basic representation using a web browser. Refer to the Maintenance tools manual (PDF) for more information. Note that the HTTP interfaces are not only available on port 80, but also on port 8080. This allows connecting to the HTTP interfaces in case a NAT service is defined on port 80.

Maintenance or management tool	Description and reference
SNMP	You can manage the 1424 SHDSL Router through SNMP using any SNMP browser. The 1424 SHDSL Router supports MIB2 and a private MIB, including traps. The private MIB files come with your copy of TMA. After installation of the TMA data files, the private MIB files are available in directory C:\Program Files\TMA\snmp[1]. The “old” MIB files, from before the SNMPv2 era, can be recognised by the following format: <filename>.mib[2]. The “new” MIB files can be recognised by the following format: <filename>_smiv2.mib Refer to the TDRE book for more information on MIB ‘s and SNMP; also refer to the SNMP configuration attributes in the TDRE book and the documentation of your SNMP browser for more information.
Easy Configurator	The Easy Configurator allows you to add HTML pages on top of the standard Web Interface by adding a set of specific files on the file system of the 1424 SHDSL Router. These files can be made either by OneAccess or by the customer itself. The goal is to offer a simple, custom made web interface which allows only to change or show those parameters that are relevant for a certain application or customer. Refer to the Maintenance tools manual (PDF) for more information. Note that the HTTP interfaces are not only available on port 80, but also on port 8080. This allows connecting to the HTTP interfaces in case a NAT service is defined on port 80.

1. The first part of the directory path may be different if you did not choose the default path during the installation of the TMA data files.
2. The filename is product dependent. To determine which MIB file corresponds with which product, refer to the *models.nms* file (located in *C:\Program Files\TMA\model*[1]).

1.3.2 Upgrading the software

Some devices are equipped with boot, loader and application software, while others only have boot and application software:

- The boot software takes care of the initial phase in the start-up sequence of the device. It is located on the lowest software level.
- The loader software takes care of the second phase in the start-up sequence of the device. It is located on the middle software level.
- The application software, also called control software or firmware, completely controls the device. It is located on the highest software level.

How to upgrade the device software, has been described in detail in:

- the TMA Quick Start Guide (PDF), for upgrading with TMA.
- the Maintenance Tools manual (PDF), for upgrading with the other tools mentioned in this chapter.

1.4 Maintenance and management tools connection possibilities

The following table gives an overview of all the maintenance and management tools and how you can connect them with the 1424 SHDSL Router:

Maintenance or management tool	**Tool - 1424 SHDSL Router connection**	
	Serial	**IP**[1]
CLI	**-**	**X**[2]
ATWIN	**-**	**X**[2]
TMA	**-**	**X**
TMA CLI	**-**	**X**
TMA Element Management	**-**	**X**
SNMP[3]	**-**	**X**
Web Interface[4]	**-**	**X**

1. An IP connection is a connection between your PC and the 1424 SHDSL Router over an IP network.
2. Using Telnet.
3. Using an SNMP browser.
4. Using a web browser.

2 Installing and connecting the 1424 SHDSL Router

First this chapter gives some important safety instructions. Then it explains how to install and connect the 1424 SHDSL Router.

You are advised to read this chapter from the beginning to the end, without skipping any part. By doing so, your 1424 SHDSL Router will be completely installed and ready for configuration when you reach the end of this chapter.

The following gives an overview of this chapter:

- 2.1 - Safety instructions / Consignes de sécurité on page 11
- 2.2 - Unpacking on page 13
- 2.3 - Selecting a site on page 14
- 2.4 - Mounting the 1424 SHDSL Router on a wall on page 15
- 2.5 - Connection precautions on page 17
- 2.6 - Connecting the 1424 SHDSL Router on page 18
- 2.7 - The front panel LED indicators on page 24
- 2.8 - Powering up the 1424 SHDSL Router on page 27

2.1 Safety instructions / Consignes de sécurité

Information to user	Informations envers l'utilisateur
• Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. • The external power supply may be delivered together with the 1424 SHDSL Router. • **This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.** • **This Class A digital apparatus complies with Canadian ICES-003.**	• Tout changement ou modification non expressément approuvé par l'instance compétente responsable pour la vérification de la conformité de l'équipement peut invalider l'autorisation accordée à l'utilisateur de mettre l'équipement en service. • L'adaptateur ou le câble d'alimentation électrique prescrit par OneAccess peut être livré d'origine ou non avec l'équipement. • Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Connection to power supply	Raccordement à l'alimentation
To connect the power supply, always respect following steps: 1. Plug power supply connector in the corresponding device's input power connector. 2. Secure power supply cable by looping it once around holding clip foreseen on device to avoid unwanted power supply cable disconnection. (Only valid if device is equipped with such a holding clip). 3. Connect the power supply plug to the electrical power network; refer to 5.7 - Power requirements on page 42.	Pour alimenter l'équipement, toujours respecter les étapes suivantes: 1. Enfichez le connecteur d'alimentation dans le connecteur d'entrée d'alimentation correspondant de l'équipement. 2. Rebouclez le câble d'alimentation autour de la bride de maintien prévue à cet effet sur le panneau arrière pour éviter l'arrachage accidentel du connecteur d'alimentation. (Uniquement pour les équipements qui sont pourvus d'une bride de maintien) 3. Branchez la fiche d'alimentation au réseau d'alimentation électrique; voir 5.7 - Power requirements on page 42.

Over-current Protection	Protection contre les surcharges
• Do not use another type of power supply than the one delivered or prescribed by OneAccess. • Always use a power cable approved for this use as the one delivered or prescribed by OneAccess. • This device requires that the building's electrical installation is designed for protection against short-circuit (over-current) protection. A fuse or circuit breaker no larger that 10A must be used on the phase conductor (AC) or the active conductor with respect to the protective earth (DC).	• Ne pas utiliser d'autre type d'adaptateur que celui livré ou prescrit par OneAccess. • Toujours utiliser un type de câble d'alimentation agréé pour cet usage comme celui livré ou prescrit par OneAccess. • La protection contre les courts-circuits de cet équipement dépend de l'installation électrique du local à laquelle il est raccordé. Vérifier qu'un fusible ou disjoncteur de maximum 10A est installé sur le conducteur de phase (AC) ou le conducteur actif par rapport à la terre (DC).

Use Precautions	Précautions d'usage
• To avoid damage to the device, please observe all procedures described in this chapter. • Disconnect the power supply before installing, moving or servicing the device. Always disconnect the electrical power supply first. • Ensure that the unit and its connected equipment all use the same power and earth wiring, to reduce noise interference and possible safety hazards caused by differences in earth potentials. • It is *essential* that the earth stud, marked with ⏚, is effectively connected to earth. Otherwise, in case of electrical problems, other devices connected to the 1424 SHDSL Router could be damaged. Also refer to 2.6.3 - Earth connection on page 22.	• Pour éviter d'endommager l'équipement, veuillez respecter toutes les procédures décrites dans ce chapitre. • Débranchez l'alimentation de la prise réseau électrique avant d'installer, déplacer ou intervenir sur l'équipement. Débranchez toujours l'alimentation réseau électrique en premier. • Assurez-vous que l'équipement et ses périphériques soient tous branchés sur un même réseau d'alimentation électrique et une équipotentielle de terre afin de réduire les interférences perturbatrices et de possibles risques de sécurité causés par des différences de potentiel entre prises de terre. • Il est *essentiel* que la borne de terre, marquée avec ⏚, soit effectivement raccordée à la terre. Autrement, en cas de défaut électrique, d'autres équipements connectés au 1424 SHDSL Router pourraient être endommagés. Voir aussi 2.6.3 - Earth connection on page 22.

2.2 Unpacking

Checking the shipping carton

Rough handling during shipping causes most early failures. Before installation, check the shipping carton for signs of damage:

- If the shipping carton is damaged, please place a claim with the carrier company immediately.
- If the shipping carton is undamaged, do not dispose of it in case you need to store the unit or ship it in the future.

2.3 Selecting a site

Warning	Avertissement
• Always place the unit in such a way that the air vents are not blocked.	• Placez toujours l'appareil de sorte que les ouïes d'aération ne soient pas obturées.

Caution	Attention
• Install the unit in an area free of extreme temperatures, humidity, shock and vibration. Position it so that you can easily see and access the front panel and its control indicators. Leave enough clearance at the back for cables and wires. • The AC/DC adapter is used to switch the device on or off by plugging it in or disconnecting it, respectively. The socket outlet shall be installed near the device and easily accessible.	• Installez l'appareil dans une zone exempte de températures extrêmes, d'humidité, de chocs et de vibrations. Positionnez-le de sorte que vous puissiez aisément accéder au panneau avant et voir ses témoins de contrôle. Laissez suffisamment d'espace à l'arrière pour les fils et les câbles. • Le convertisseur d’alimentation AC/DC est utilisé comme dispositif interrupteur. La prise de courant doit être installée à proximité de l’appareil et facilement accessible.

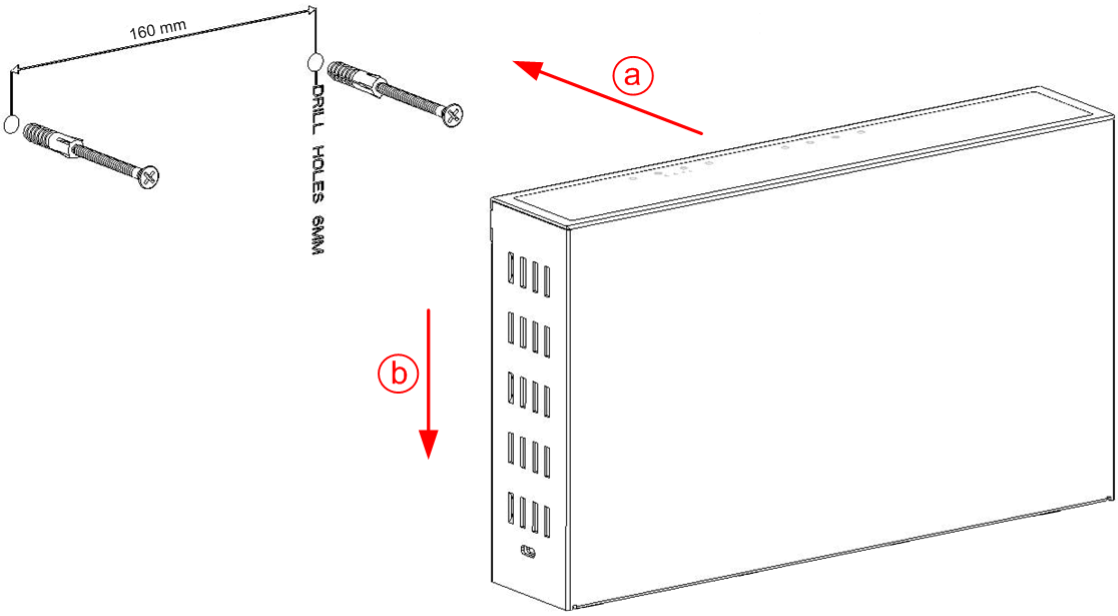
2.4 Mounting the 1424 SHDSL Router on a wall

Procedure

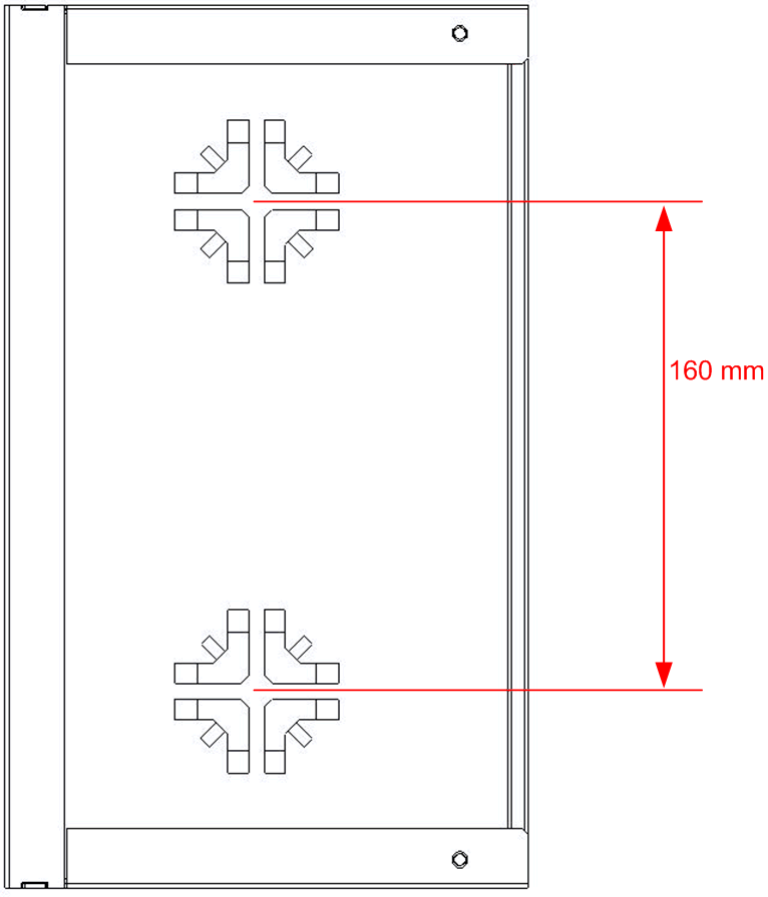
The bottom plate of the 1424 SHDSL Router has 2 notches in order to enable wall mounting. Refer to the figure below, for the position of these notches. By installing two screws at the required distance, the device can be hung on any vertical surface.

In order to do so, proceed as follows:

Step	Action
1	Drill two holes in the wall, according to the following specifications: • hole diameter: 6 mm • distance between the holes: 160 mm • hole depth: at least 50 mm
2	Insert two standard wall plugs in the holes. The plugs should have the following dimensions: • diameter: 6 mm • length: < 50 mm
3	Screw in two standard screws in the plugs. Leave a distance of 5 mm between the wall and the head of the screw. The screws should have the following dimensions: • diameter: 4 mm • length: 40 mm • The head of the screws may have a diameter of maximum 8 mm.
4	Slide the 1424 SHDSL Router over the screws until it touches the wall, and gently push it down. If necessary, adjust the screws in the notches of the device.



Bottom plate of the 1424 SHDSL Router



2.5 Connection precautions

ESD WARNING

The circuit boards are sensitive to electrostatic discharges (ESD) and should be handled with care. It is advisable to ensure an optimal electrical contact between yourself, the working area and earth before touching any circuit board. Take special care not to touch any component or connector on the circuit board.

The connectors of the 1424 SHDSL Router should only be connected to the following circuit types:

Interface type	Interface identification	Connector type	Circuit type
SHDSL	LINE	RJ45	TNV-3
LAN[1]	LAN1 1...4	RJ45	SELV
	LAN2	RJ45	SELV
RS232[2]	Console	RJ45	SELV
USB		USB	SELV
Earth stud		Clinching stud/screw hole	Earth

1. 10/100 Mbps interface
2. V.24

- Inside building circuit: Circuit remaining inside building and not subject to telecom network primary nor secondary lightning strikes.
- Outside building circuit: Circuit routed going outside building and possibly subject to telecom network secondary lightning strikes.
- SELV or *Safety Extra Low Voltage*: Inside building circuit designed to not exceed safe voltage value.
- TNV or *Telecom Network Voltage*: User's accessible internal circuit designed to not exceed specified voltage limits:
  - TNV-3 : Outside building circuit exceeding SELV voltage limits but respecting TNV voltage limits

2.6 Connecting the 1424 SHDSL Router

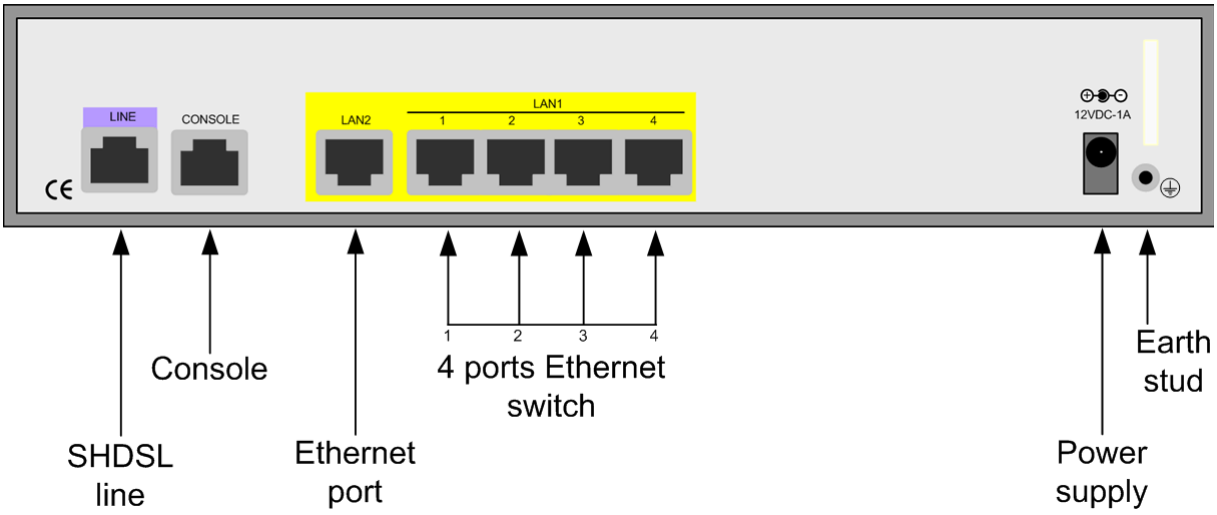
This section describes the 1424 SHDSL Router rear panel. It identifies the interface type and port numbering, and explains how to connect the device.

The following gives an overview of this section:

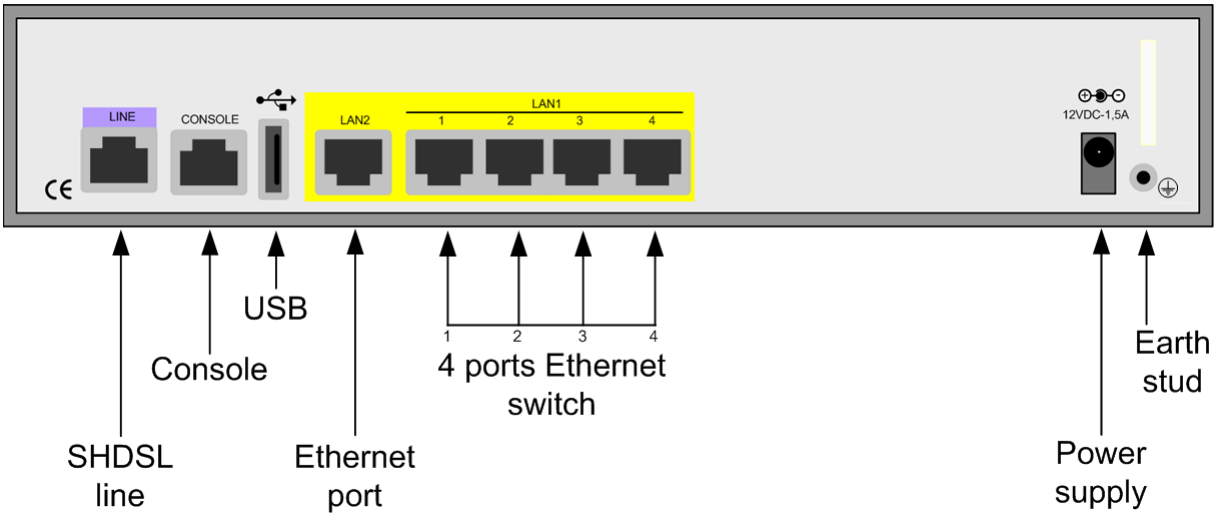
- 2.6.1 - Rear view of the 1424 SHDSL Router on page 19
- 2.6.2 - The different parts of the 1424 SHDSL Router on page 21
- 2.6.3 - Earth connection on page 22

2.6.1 Rear view of the 1424 SHDSL Router

The following figure shows the back panel of the 1424 SHDSL Router:



The following figure shows the back panel of the 1424 SHDSL Router with USB connector:



Following connectors are present:

Interface type	Interface identification	Type	Function
Line	LINE	RJ45	SHDSL line connector
Console	CONSOLE	RJ45	V.24 DTE interface
USB		USB	USB interface
Ethernet	LAN2	RJ45	Ethernet LAN connector
4 port Ethernet switch	LAN1 1...4	RJ45	Ethernet LAN connectors
Power	12V-1A or 12V-1,5A	DC input jack	Power input
Earth stud		Clinching stud/screw hole	Earth connection

2.6.2 The different parts of the 1424 SHDSL Router

The following table gives an overview of the possible connectors located at the back of the 1424 SHDSL Router and explains their function:

Interface identification	Interface function
LINE	This RJ45 connector is the SHDSL line connector. Connect one side of an SHDSL line cable to the LINE connector of the 1424 SHDSL Router and the other side to an SHDSL outlet. For optimum performance, the used line pairs have to be properly twisted. Refer to 5.1 - SHDSL line specifications on page 35 for the pin lay-out of this connector.
CONSOLE	This RJ45 connector is a V.24 DTE interface. This enables you to manage the 1424 SHDSL Router locally. For more information, refer to 5.5 - Console port specifications on page 40.
USB	This is a USB version 2.0 interface and can operate as a master. It can deliver up to 500mA at 5V. It can be used to connect a mobile USB device for backup of the DSL connection over the mobile 3G network.
LAN1 LAN2	These RJ45 connectors are the Ethernet LAN connectors. There are 4+1 Ethernet LAN connectors on the 1424 SHDSL Router. The separate Ethernet interface can be used as main WAN link or as a back-up WAN link interface. The Ethernet switch is VLAN manageable. Connect one side of an Ethernet LAN cable to the LAN connector of the 1424 SHDSL Router and the other side to an Ethernet network outlet. Each LAN interface supports 10/100 Mbps auto-sense and auto cross-over. Refer to 5.2 - LAN1 4 port Ethernet switch specifications on page 37 and 5.3 - LAN2 interface specifications on page 38 for the pin lay-out of this connector.
12VDC-1A or 12V-1,5A	This is the power input. Insert the plug of the external power supply in this socket. Secure the power supply connection by installing the DC power supply cord into the holding clip provided on the back panel. Refer to 5.7 - Power requirements on page 42 for the power specifications of the 1424 SHDSL Router.
⏚	This is the earth stud. Connect it to a reliable earth by means of a yellow-green wire of at least 1,5mm². Refer to 2.6.3 - Earth connection on page 22 for more information. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable earth is available.

- The back panel may be slightly different on specific versions of the 1424 SHDSL Router.

2.6.3 Earth connection

Safety

- It is *essential* that the earth stud on the back panel is effectively connected to earth. Otherwise, in case of electrical problems, other devices connected to the 1424 SHDSL Router could be damaged.
- The hard wired Protective Earth connection must be carried out by authorized service personel.

- The earth wire must be mechanically protected when crossing floors and walls and never be built directy.
- The connection must be made with a green/yellow wire of at least a 1 mm² section.
- 2 versions of the back panel exist, one with a screw hole and one with a clinching stud as earth connection point.
  How to connect the earth cable with the back panel of the devices, is different in both cases; this is explained further down.

Earth Connection

2 versions of the back panel exist:

- one with a screw hole as earth connection point.
- one with a clinching stud as earth connection point.

To connect an earth wire to the *screw hole* on the back panel, use:

- 1 M3 spring or lock washer
- 1 M3 ring tongue
- 1 M3 screw

Proceed as follows:

Step	Action
1	If not already done so, the earth cable that will be connected to the screw hole, must be equipped with the M3 ring tongue.
2	The spring/lock washer must be mounted between the M3 ring tongue and the M3 screw; this is necessary because the M3 ring tongue must make direct contact with the back panel.
3	Use the M3 screw to fix everything; make sure that it is firmly fixed. This makes sure that the three parts are firmly fixed against the back panel, and cannot get loose anymore.

To connect an earth wire to the *clinching stud* on the back panel, use:

- 2 round M3 washers; these are delivered with the 1424 SHDSL Router.
- 1 M3 nut; this is also delivered with the 1424 SHDSL Router.
- 1 M3 ring tongue; this is *not* delivered with the 1424 SHDSL Router.

Proceed as follows:

Step	Action
1	Slide one of the round M3 washers over the clinching stud.
2	If not already done so, the earth cable that will be connected to the clinching stud, must be equipped with an M3 ring tongue.
3	Slide the M3 ring tongue of the earth cable over the clinching stud.
4	Slide the second M3 round washer over the clinching stud.
5	Use the M3 nut to fix everything; make sure it is firmly fixed.

2.7 The front panel LED indicators

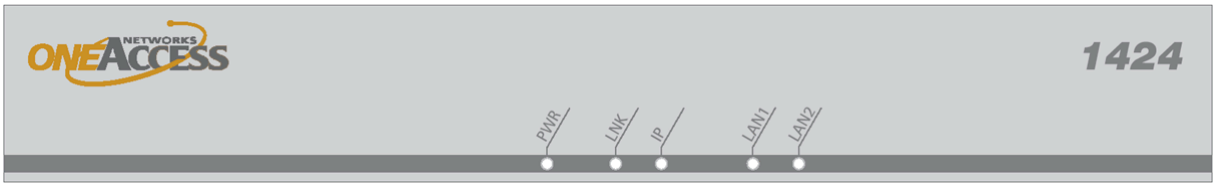
This section gives an overview of the front panel LEDs and what they indicate. The following gives an overview of this section:

- 2.7.1 - Introducing the front panel LEDs on page 25
- 2.7.2 - LED states on page 26

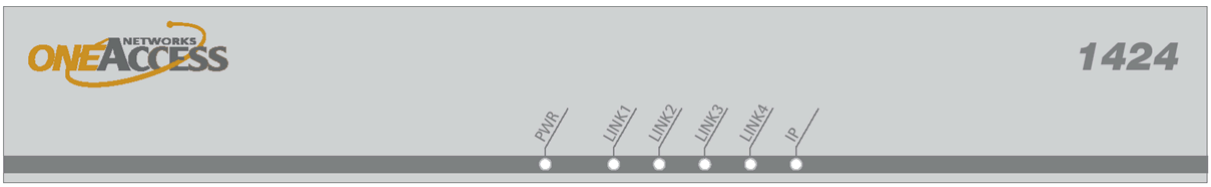
2.7.1 Introducing the front panel LEDs

When all the connections are made and the 1424 SHDSL Router is powered, the LEDs on the front panel reflect the actual status of the device.

The following figure shows the front panel LED indicators of the 1424 SHDSL Router:



The following figure shows an alternative version of the front panel LED indicators of the 1424 SHDSL Router:



The front panel may be slightly different on specific versions of the 1424 SHDSL Router.

LED states

One front panel LED can reflect different status modes by the way it lights up. The front panel LEDs can light up as follows:

LED state	LED duty cycle	Description
OFF	0 %	The LED never lights up.
ON	100 %	The LED lights up continuously.
blinking	50 %	The LED is alternating 0,5 seconds ON, and 0,5 seconds OFF.

2.7.2 LED states

The state of the LEDs indicates the following:

LED name	Colour	Description
PWR	Bicolour	• OFF: no input power • ON - Green: switched on and operational • ON - Red: switched on and not operational • Blinking green : (Re)boot in progress
LINK	Bicolour	• OFF: The SHDSL interface is not configured. • ON - Green: The SHDSL uplink is synchronised. • ON - Red: The SHDSL interface is not synchronised (although it is configured). • Blinking green: The SHDSL synchronisation is in progress.
IP	Bicolour	• OFF: No IP routing has been configured. • ON - Green: All IP interfaces on the SHDSL link are up. • ON - Red: All IP interfaces on the SHDSL link are down. • Blinking green: At least one IP interface is up and at least one is not up on the SHDSL link.
LAN1	Green	• OFF: None of the ports on the Ethernet switch is active. • ON - Green: At least one of the ports on the Ethernet switch is active. • Blinking green: Traffic in progress on at least one of the ports on the Ethernet switch.
LAN2	Green	• OFF: The second Ethernet port is inactive. • ON - Green: The second Ethernet port is active. • Blinking green: Traffic in progress on the second Ethernet port.

2.8 Powering up the 1424 SHDSL Router

To power up the 1424 SHDSL Router, always follow these steps:

- Connect the DC power input jack from the power supply to the DC power input of the rear panel of the device.
- Connect the power supply to the AC mains.

Self test

A few seconds after the power is switched on, the 1424 SHDSL Router performs a series of self-tests and loads the software into memory (RAM), during which the *PWR* LED on the front panel blinks.

At the end of the software loading, after about 30 seconds, if:

- the *PWR* LED remains green continuously, it means that the software initialization was successful.
- the *PWR* LED blinks, it means that:
  - the software was absent,

  or,
  - there was an error during the software loading process.

3 DIP switches of the 1424 SHDSL Router

This chapter informs about the 1424 SHDSL Router motherboard, and shows how to open the housing.

The following gives an overview of this chapter:

- 3.1 - The 1424 SHDSL Router motherboard on page 29
- 3.2 - Opening and closing the housing on page 30

Default settings are printed in **bold**.

3.1 The 1424 SHDSL Router motherboard

The 1424 SHDSL Router motherboard is by default equipped with the following interfaces:

- SHDSL line connector
- Console port
- Managed switch with 4 ports
- Additional Ethernet port

On some versions of the 1424 SHDSL Router, the motherboard is also equipped with:

- a USB port

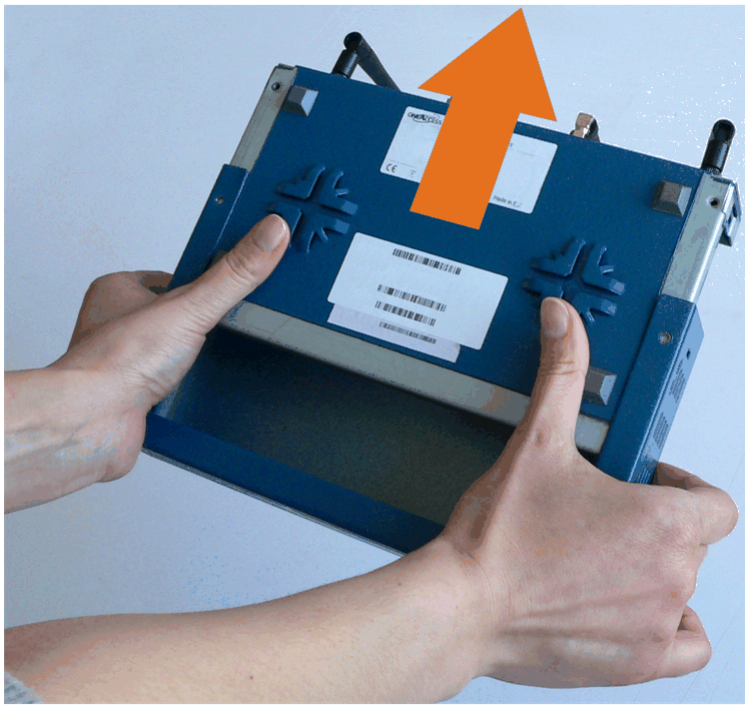
No DIP switches have to be set by the user.

For more information, refer to 2.6.1 - Rear view of the 1424 SHDSL Router on page 19.

3.2 Opening and closing the housing

Opening the housing

To open the housing of the 1424 SHDSL Router, proceed as follows:

Step	Action
1	Disconnect the external power supply; always disconnect the AC input first, then disconnect the DC input jack on the device itself.
2	Unscrew both screws on the bottom of the unit and remove them.
3	Slide the cover backwards and remove it, but always keep the following in mind: Slide the cover backwards by pressing underneath the wall mounting holes, as shown in the picture below. 

Closing the housing

To close the housing of the 1424 SHDSL Router, proceed as follows:

Step	Action
1	Slide the cover back over the device. Do not close the housing while holding it upside-down.
2	Fasten both bottom screws .
3	Reconnect the external power supply; first, connect the DC input jack on the device itself, then connect the power supply to the AC mains.

4 TMA sub-system picture

The sub-system picture is a TMA tool that visualises the status information of the 1424 SHDSL Router. This chapter explains how to display the sub-system picture, and how to interpret the visual indications.

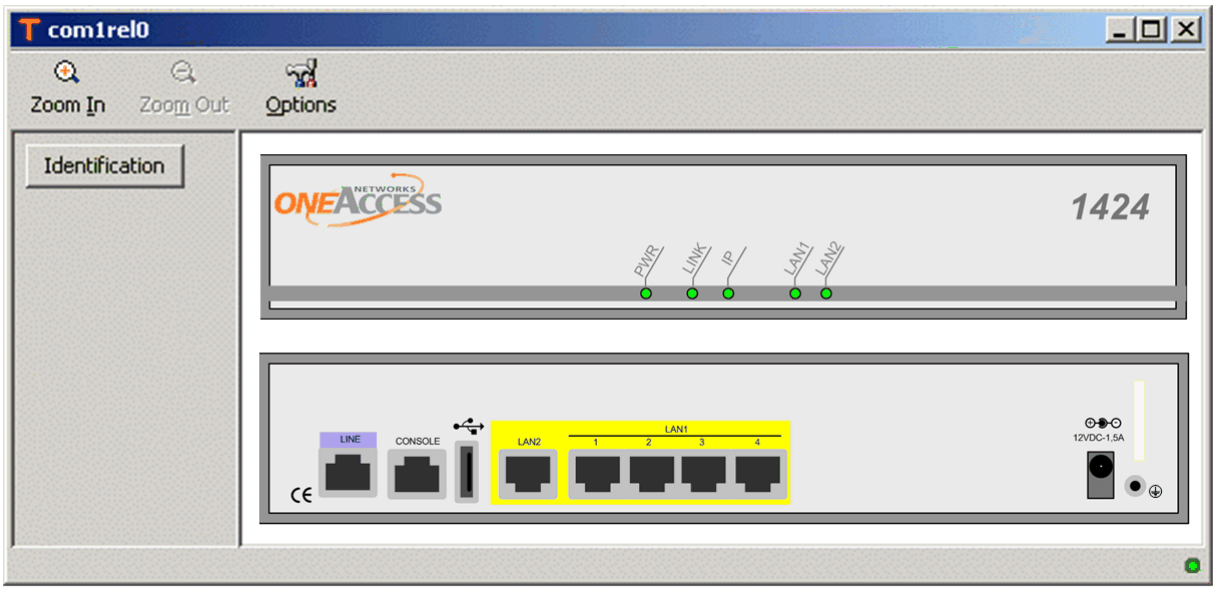
How to display the sub-system picture?

To display the sub-system picture of the 1424 SHDSL Router, click on the sub-system picture button located in the TMA toolbar: .

Structure of the sub-system picture

This paragraph displays and labels the different elements of the sub-system picture. It also explains how the visual indications should be interpreted.

Below, the 1424 SHDSL Router sub-system picture is displayed:



5 Technical specifications

This chapter gives the technical specifications of the 1424 SHDSL Router. The following gives an overview of this chapter:

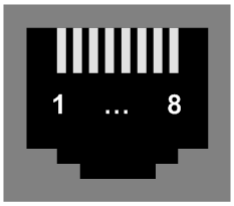
- 5.1 - SHDSL line specifications on page 35
- 5.2 - LAN1 4 port Ethernet switch specifications on page 37
- 5.3 - LAN2 interface specifications on page 38
- 5.4 - USB interface specifications on page 39
- 5.5 - Console port specifications on page 40
- 5.6 - Memory specifications on page 41
- 5.7 - Power requirements on page 42
- 5.8 - Dimensions on page 43
- 5.9 - Safety compliance on page 44
- 5.10 - Over-voltage and over-current protection compliance on page 44
- 5.11 - EMC compliance on page 44
- 5.12 - Environmental compliance on page 45

5.1 SHDSL line specifications

- Single pair, dual pair, 4 pair line access
- Connector: RJ45
- Impedance: 135 Ω
- Cable to be used: 2*2*CAT5E twisted pair, min. No. 26 AWG.
  An RJ45-RJ45 SHDSL cable with label *4028 761 A00* is included with the device. Refer to Cable Lay-out on page 36 for the lay-out of this cable.
- Coding: TCPAM, compliant to ITU-T G.991.2; G.SHDSL, and G.SHDSL.bis via TCPAM-16 and TCPAM-32
- Line speeds:
  - Single pair: 192 … 5696 in steps of 64kbps
  - Two pair: 384 … 11392 in steps of 128kbps
  - Four pair: 768 … 22784 in steps of 256kbps
- Handshaking: compliant G.994.1 (automatic speed negotiation) or fixed speed
- Performance monitoring: compliant G.826 (errored seconds, severely errored seconds, unavailability seconds)

The line connector lay-out

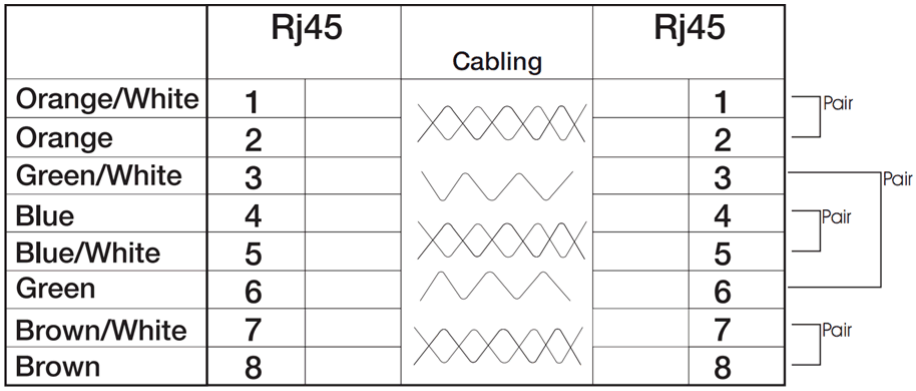
The following table shows the connector layout of the RJ45 line connector:

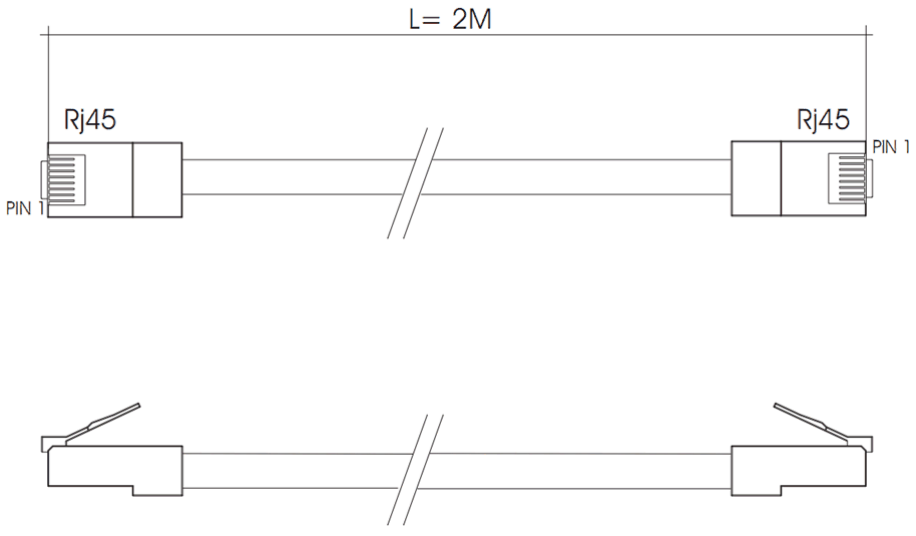
Pin	Signal	Figure
1	line 2 (only on the 2P and 4P versions)	
2	line 2 (only on the 2P and 4P versions)	
3	line 3 (only on the 4P versions)	
4	line 1	
5	line 1	
6	line 3 (only on the 4P versions)	
7	line 4 (only on the 4P versions)	
8	line 4 (only on the 4P versions)	

Cable Lay-out

- RJ45-RJ45 SHDSL cable with label *4028 761 A00*:

Cable/Modular Plug Specification
Type Cable : UTP Cat 5E AWG24 Stranded Color: Violet
Modular Plug RJ45 8Pos. 8Contacts Unshielded Modular Plug RJ45 8Pos. 8Contacts Unshielded Color : Transparent Plating:Gold Min. 6 Microns
Voltage = 30V Min Working T° = 60°C Min Flammability = UL94V-1 or UL94V-0





5.2 LAN1 4 port Ethernet switch specifications

- Number of ports: 4
- Connectors: RJ45 (EIA/TIA 568B)
- Cable to be used: standard Ethernet cable, minimum category 5
- Applicable standards: IEEE 802.3 (10Mbps Ethernet), IEEE 802.3u (100Mbps Ethernet)
- Characteristics:
  - 10 / 100 Mbps auto-sense
  - Half or full duplex
  - Auto-negotiation
  - Auto cross-over MDI/MDI-X for automatic connection to a terminal or switch
- The following LEDs are available built-in on each Ethernet interface connector:

Colour	Description
Green	• OFF: link down. • ON: link up; blinking in case of activity.
Yellow/orange	• OFF: speed is 10 Mbps. • ON: speed is 100 Mbps.

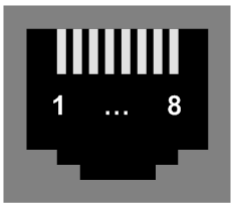
- The layout of the connectors is identical to the LAN interface, described in 5.3 - LAN2 interface specifications on page 38: transmission pairs 1-2, receive pairs 3-6
- VLAN support:
  - maximum 16 VLANs
  - 802.1Q VLAN tagging per port
  - tagged, untagged or trunking VLAN operation

5.3 LAN2 interface specifications

- Connector: RJ45 (EIA/TIA 568B)
- Cable to be used: standard Ethernet cable, minimum category 5
- Applicable standards:
  - IEEE 802.3 (10Mbps Ethernet)
  - IEEE 802.3u (100Mbps Ethernet)
  - IEEE 802.1ag (OAM on Ethernet interface)
  - ITU-T Y.1731 (OAM on Ethernet interface)
- Speed: 10/100 Mbps auto-sense
- Auto cross-over MDI/MDI-X for automatic connection to a terminal or switch
- VLAN support
- The following LEDs are available built-in on each Ethernet interface connector:

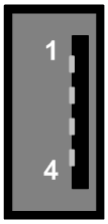
Colour	Description
Green	• OFF: link down. • ON: link up; blinking in case of activity.
Yellow/orange	• OFF: speed is 10 Mbps. • ON: speed is 100 Mbps.

The following table shows the connector layout of the RJ45 Ethernet LAN interface connector:

Pin	Signal	DTE	DCE	Figure
1	transmit (+)	Out	In	
2	transmit (-)	Out	In	
3	receive (+)	In	Out	
4	not used	-		
5	not used	-		
6	receive (-)	In	Out	
7	not used	-		
8	not used	-		

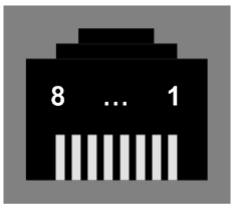
5.4 USB interface specifications

- Standard Type A USB connector.
- USB version 2.0 interface.
- The USB interface can operate as a master.
- The USB master interface can deliver up to 500mA at 5V.
- The following table shows the connector layout of the USB connector:

Pin	Signal	Function	Figure
1	Vcc	+5V	
2	D-	Data-	
3	D+	Data+	
4	GND	Ground	

5.5 Console port specifications

- Connector: RJ45 (EIA/TIA 568B)
- Data:
  - RS232
  - 9600 bps
  - 8 data bits
  - no parity
  - 1 stop bit
- The following table shows the connector layout of the RJ45 Console connector:

Pin	Abbreviation	DCE	Figure
1	TX	Out	
2	RX	In	
3	GND	-	
4	NC	-	
5	NC	-	
6	NC	-	
7	NC	-	
8	NC	-	

A console cable for device configuration and maintenance only requires TX, RX and GND to be connected; refer to Annex A: - Console cable on page 47 for more information about the cable.

5.6 Memory specifications

- Flash memory: 32 MB
- RAM: 64 MB

5.7 Power requirements

Power adapter to be used: Switched Power Module AC in, 50/60 Hz, Vout=12 Vdc;
Iout=1A for devices without USB interface; Iout=1,5A for devices with USB interface.
Note that a 24/48VDC power adapter can also be delivered.

Do not use another type of power supply than the one recommended by OneAccess.

5.8 Dimensions

The standard version of the 1424 SHDSL Router has a metal housing with the following characteristics:

- Width: 275 mm
- Height: 55 mm
- Depth: 146 mm
- Weight: 1,26 kg

Alternatively, a plastic housing may be offered with the following characteristics:

- Width: 270 mm
- Height: 65 mm
- Depth: 145 mm
- Weight: 0,8 kg

The weight of the external power adaptors is as follows:

Description	**Weight (kg)**
Various AC power plugs	0,1
PWR-PLUG +/-48/24VDC FOR 7,5 /12VDC CPE DEVICES	0,3

5.9 Safety compliance

- EN60950-1: Safety of information technology equipment, including electrical business equipment.
- Class II equipment.

5.10 Over-voltage and over-current protection compliance

The over-voltage and over-current protection complies with ITU-T K.44 and ETSI EN 300 386 recommendations.

5.11 EMC compliance

- CE
- FCC class A
- EN55022 Emissions
- EN55024 Immunity
- EN61000-3-2 Harmonics
- EN61000-3-3 Voltage fluctuations and flicker
- EN61000-4-2 ESD
- EN61000-4-3 Radiated immunity
- EN61000-4-4 EFT/burst
- EN61000-4-5 Surge
- EN61000-4-6 Conducted immunity
- EN61000-4-8 Power magnetic field immunity
- EN61000-4-11 Voltage dips & drops
- EN300386 EMC Requirements

5.12 Environmental compliance

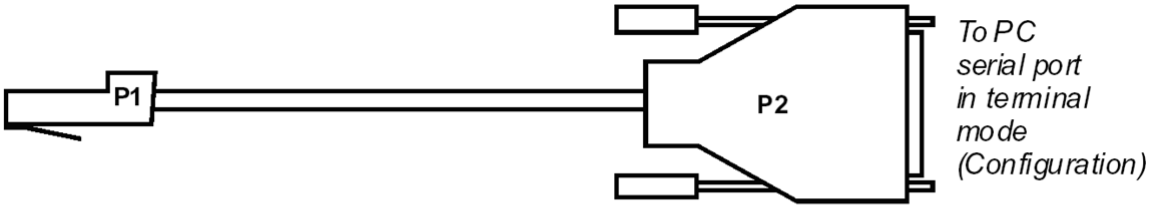
- Storage conditions: ETSI ETS 300 019-1-1 Class 1.1. In addition, the storage temperature has to be between -25 to +70°C, with a relative humidity between 0 and 95% non-condensing.
- Transport conditions: ETSI ETS 300 019-1-2 Class 2.3.
- Stationary use conditions: ETSI ETS 300 019-1-3 Class 3.2. In addition, a relative humidity between 0 and 95% non-condensing and an ambient operational temperature between -10 to 50°C is supported.
- International protection (IP) class of protection against solid and liquids: IP30.

Annex

Annex A: Console cable

Standard console cable

The following figure shows the console cable assembly; it has reference code 501288:



P1 RJ45	P2 SUB-D 9 pins Female	Signal
1	2	TX
2	3	RX
3	5	GND

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